

Diet and Recovery: the Role of Nutrition after a Natural Disaster

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Psychological impact of natural disasters

- Studies of survivors of natural disasters show about 20-30% of population show immediate or delayed symptoms of psychological stress including PTSD, depression and anxiety
 - (Bonanno *et al.*, 2010; Suhail *et al.*, 2009; Wang *et al.*, 2010)
- There are a range of treatments - cognitive-behavioural therapy, EMDR, EQ simulators, medications
- These are hard to implement widely following a disaster and side effects problematic

Nutrition after a disaster

- Immediately after a natural disaster, nutrient intake
- decreases *when it should be increased*
- Based on a longitudinal study people who were impacted more severely by earthquake reported unhealthier eating habits, more difficulty maintaining a healthy diet & were more likely to choose food for mood reasons post-quake (Kuijer et al., 2012)
- Some evidence that those who eat more poorly show a poorer psychological recovery (Yesilyaprak et al., 2007)

The “natural experiment”

The UC ADHD Diagnostic Assessment & Research Group
RCT of EMP+

- Participants all assessed prior to the quake (t0)
- Some taking the supplement
- Some not taking the supplement
- Surveyed by phone 1 and 2 weeks post-quake (t1, t2)
- Used Depression, Anxiety, Stress Scale (DASS)
- + EQ impact questions

➤ Rucklidge et al., 2011; Rucklidge and Blampied, 2011

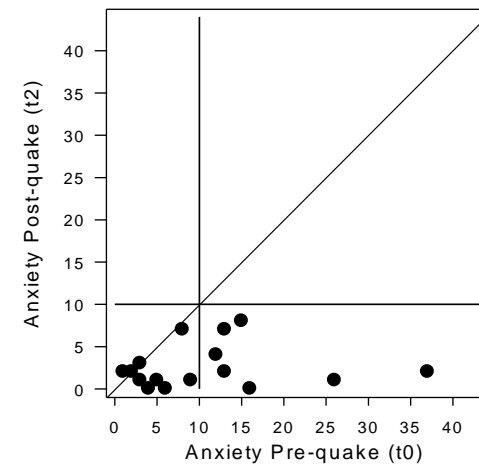
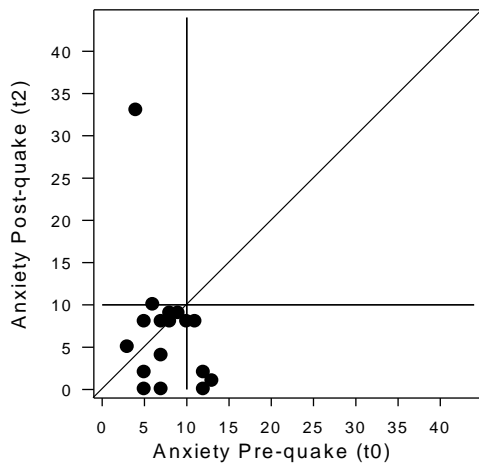
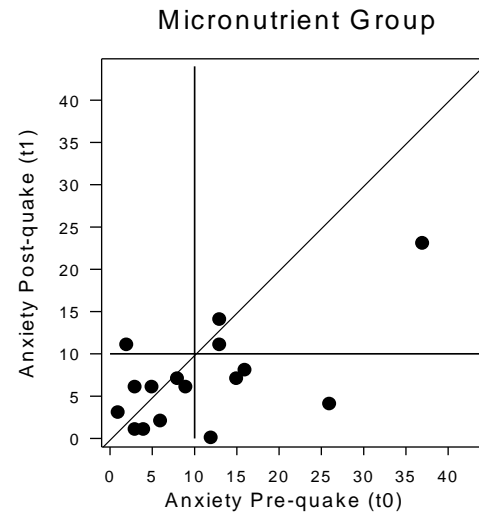
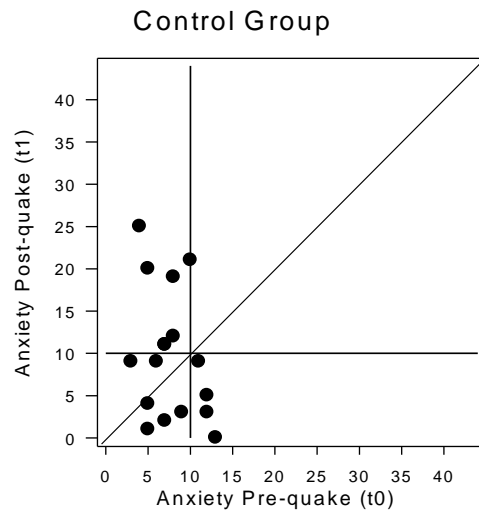
What is in EMP+/CNE?

A nutritional supplement containing 36 ingredients

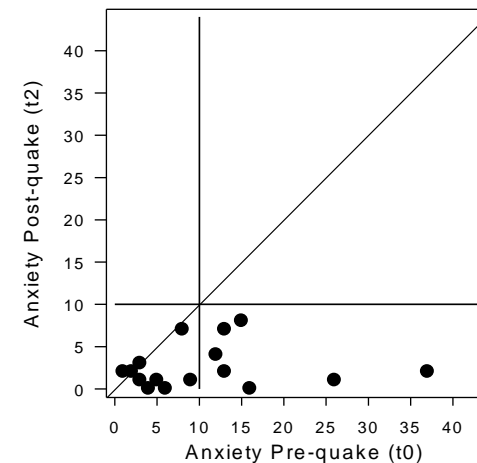
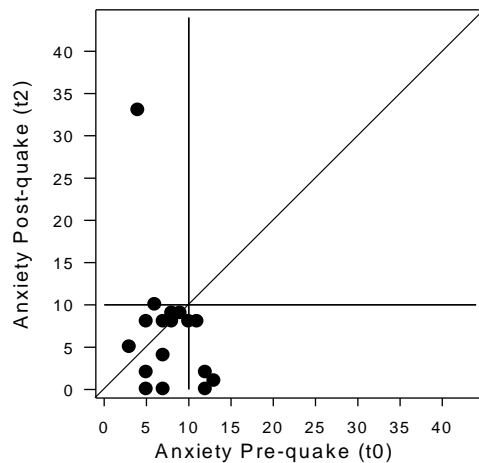
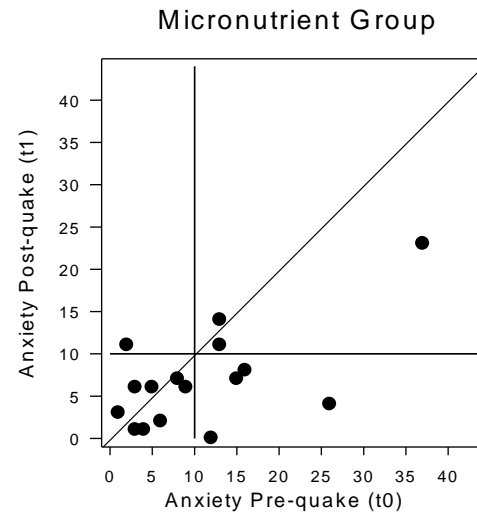
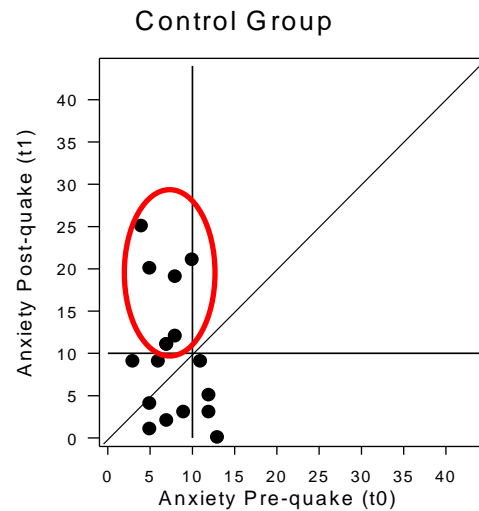
- 14 vitamins (including all the B vitamins)
- 16 minerals
- 3 amino acids
- 3 antioxidants

Has been shown to benefit bipolar disorder, autism, and ADHD symptoms across a number of international studies

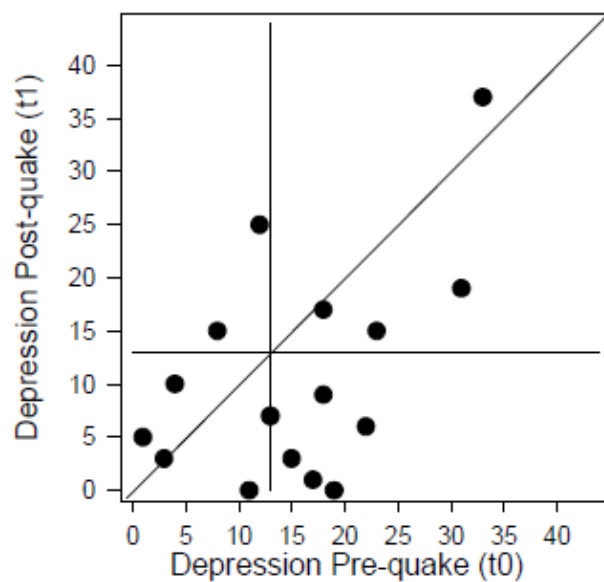
Effects on Anxiety & Depression



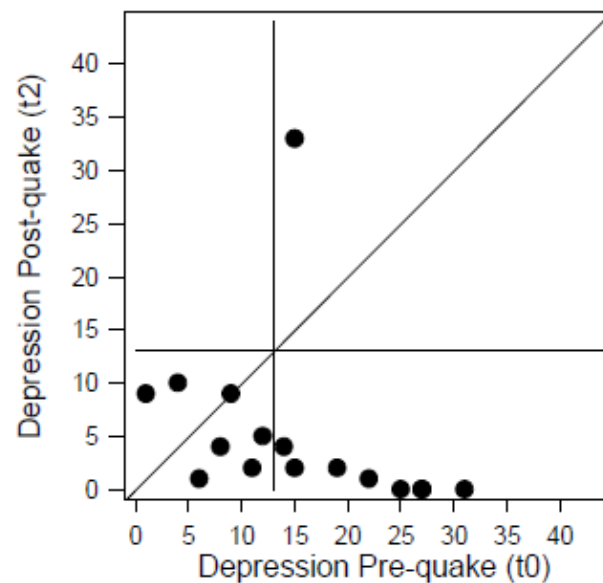
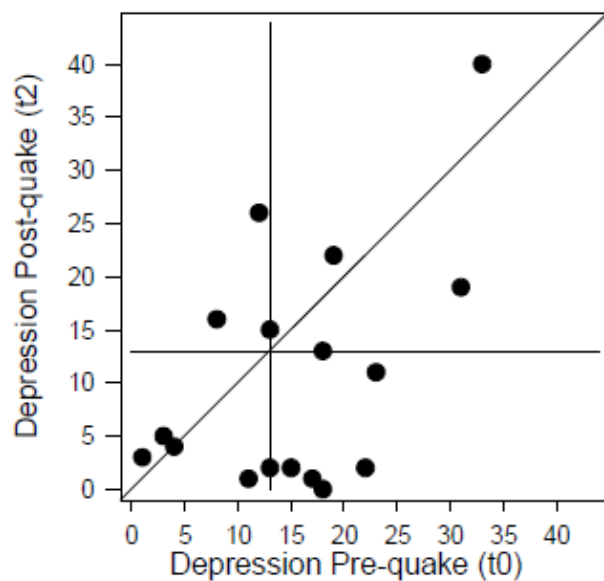
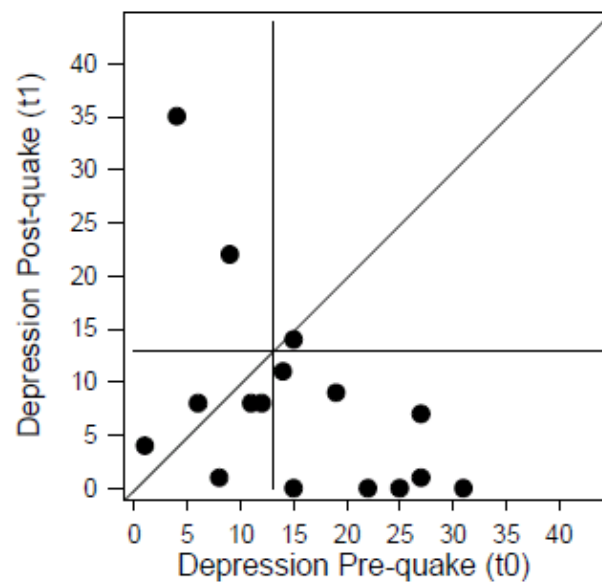
Effects on Anxiety & Depression



Control Group



Micronutrient Group



But can these positive changes
generalize to the wider
“nonclinical” population?

Micronutrients for stress

- 5 RCTs have shown that over-the-counter micronutrients
 - decrease stress/anxiety, improve energy and mood in both stressed and non-stressed individuals
 - Carroll et al., 2000; Gruenwald et al., 2002; Schlebusch et al., 2000; Kennedy et al., 2010, 2011; Stough et al., 2011



- 185 people died, 6659 injured, 30,000 homes destroyed, cost to NZ: 12.9 billion dollars



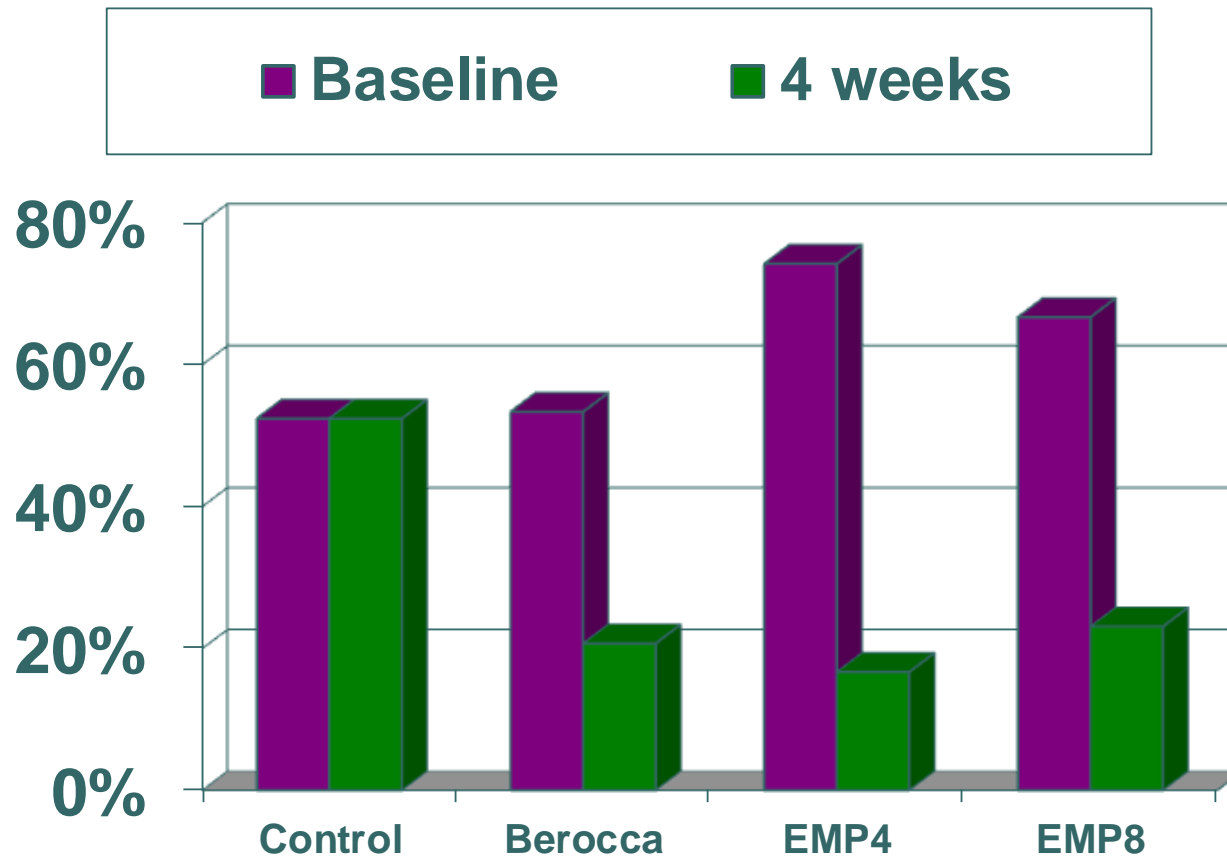
Post-Quake RCT of micronutrients

- ▶ Participants recruited on-line ~ 3-4mo after quake
 - ▶ 201 completed survey: 127 eligible
 - ▶ 91 randomized
 - 30 to Berocca™ (29 completed)
 - 31 to EMP+4 (30 completed)
 - 30 to EMP+8 (27 completed)
 - ▶ 4 week trial with 1 month natural follow up
 - data collection May to July 2011
 - ▶ Monitored weekly with on-line
 - assessing stress, mood, anxiety and PTSD symptoms
 - ▶ 25 of original pool served as controls (7 medicated)
- [Rucklidge, et al., 2012]

Results

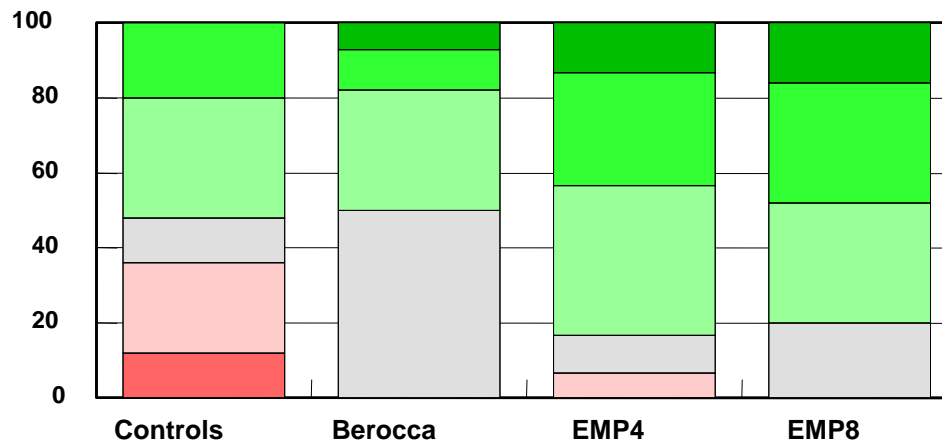
- No mean group differences in SES, age, sex, etc
- All 3 tx groups showed large (Berocca) or very large (EMP+ @ both doses) changes from baseline
- EMP+ (both doses) showed superiority to Berocca for intrusions, and higher dose for CGIs of stress, anxiety, energy, mood
 - no tx differences on other measures
- 1 month follow up:
 - those who stayed on continued to improve, those who didn't, stayed same
 - preference for higher dose of micronutrients:
 - five times more of these participants stayed on micronutrients compared with those in the Berocca™ group

% with significant PTSD symptoms @ baseline & 4 weeks



Anxiety

share
of
total

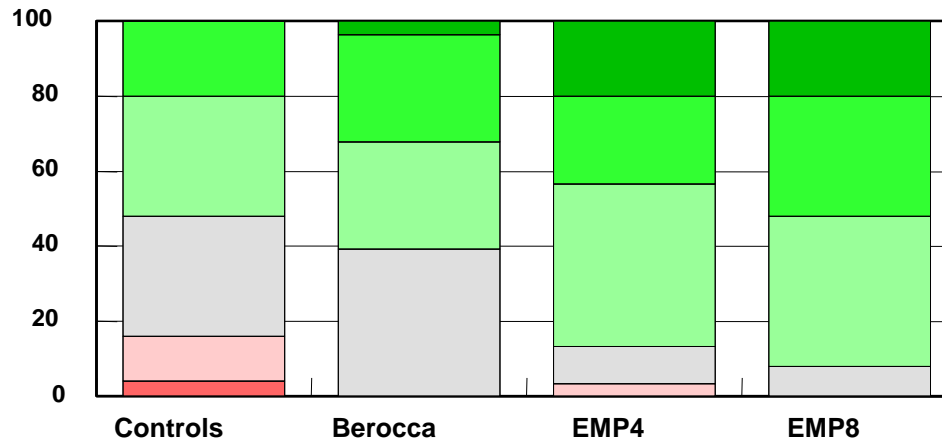


Anxiety

- very much improved
- much improved
- minimally improved
- no change
- minimally worse
- much worse
- very much worse

Mood

share
of
total

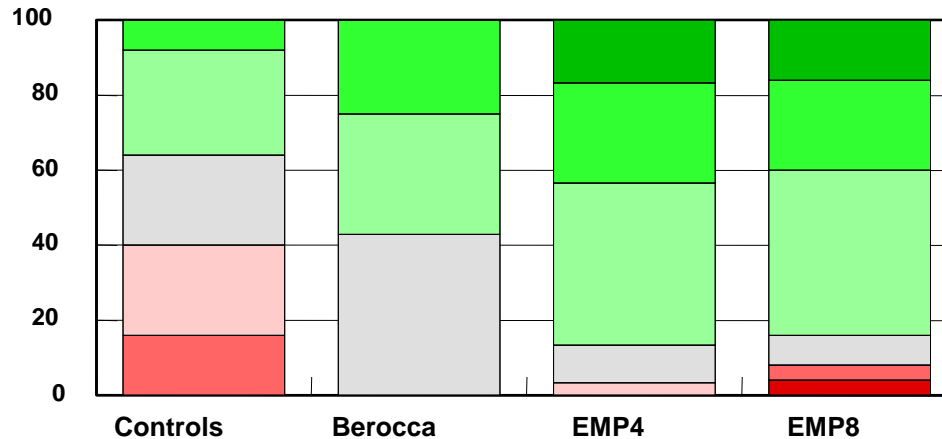


Mood

- very much improved
- much improved
- minimally improved
- no change
- minimally worse
- much worse
- very much worse

Stress

share
of
total



Stress

- very much improved
- much improved
- minimally improved
- no change
- minimally worse
- much worse
- very much worse

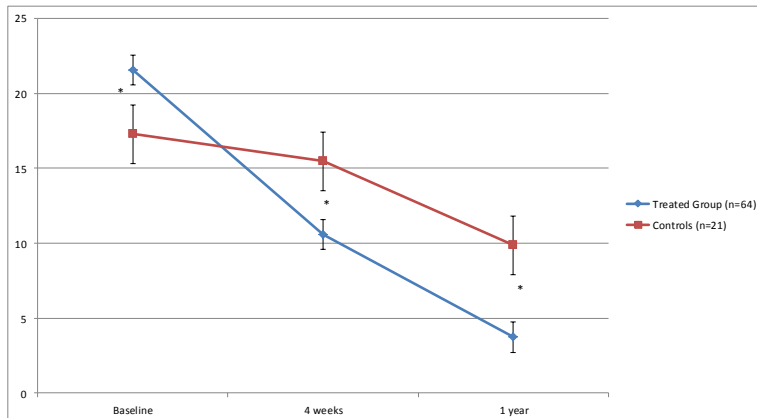
Would symptoms have remitted over time?

- 30% - got worse over baseline
- Stress was ongoing
 - June 13th magnitude 6 quake occurred during data collection
- Contact with investigators minimal (1 face-to-face + on-line survey)
- Substantial change noted in a difficult to treat presentation (PTSD symptoms)
- Berocca has been shown to be superior to placebo

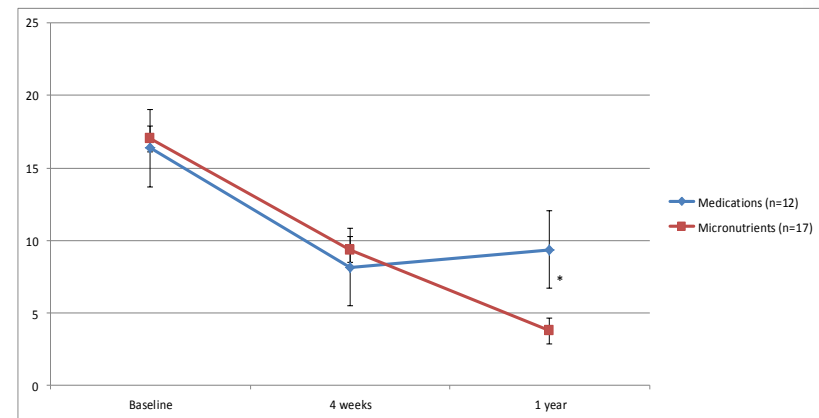
Long-term follow-up @ 12 mo

Stress

ES = 1.31



Depression



[Rucklidge et al., 2014]

Why might this approach work?

thiamine (B₁)



Protects adrenal glands from exhaustion

niacinamide (B₃)



Shunts tryptophan to serotonin

Vitamin B₆



Cofactor for synthesis of GABA, serotonin, and dopamine

Vitamin B₁₂



Normalizes cortisol production

Vitamin C



Given in higher than RDA values, supports adrenal function and decreases high cortisol levels

Mg, Zn & Ca

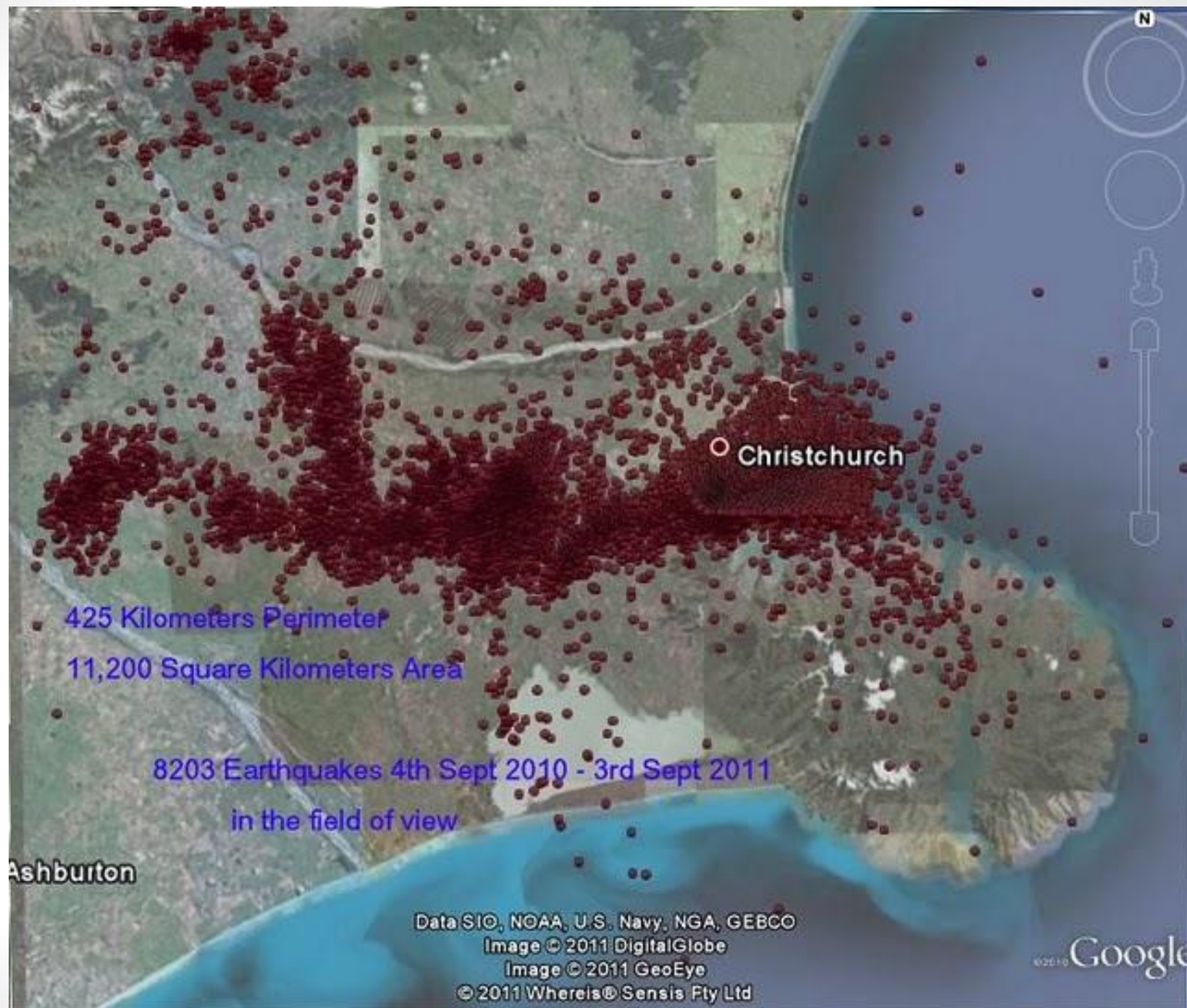


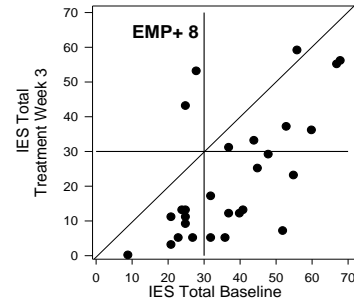
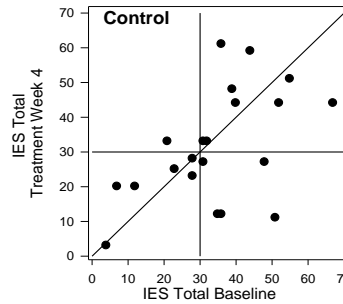
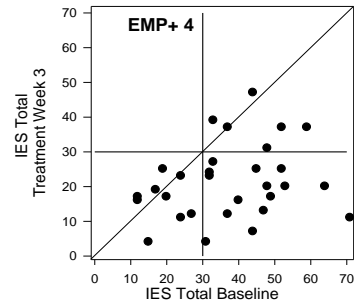
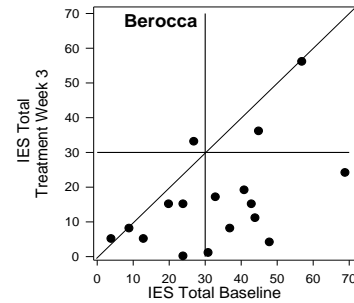
Play essential roles as co-enzymes in hundreds of biochemical reactions

Conclusions

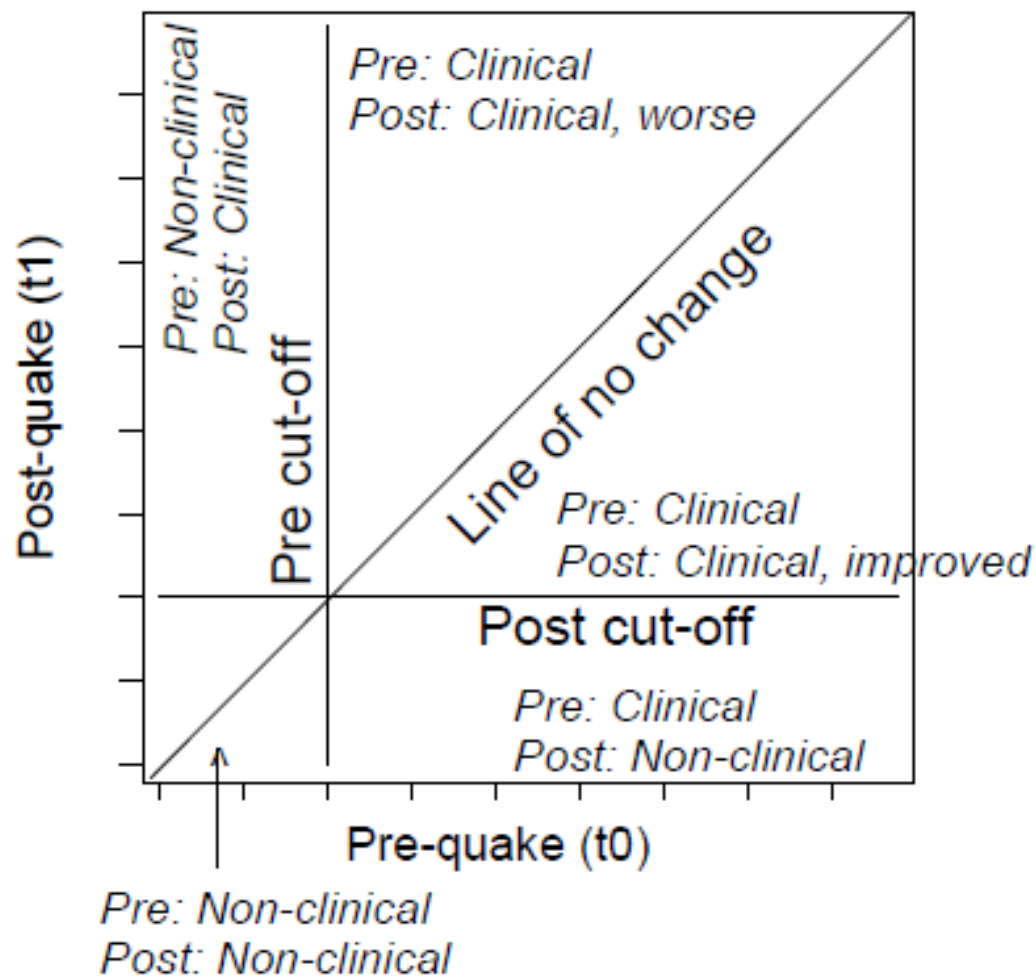


- People's nutritional intake is compromised after a natural disaster
- Nutritional supplements are beneficial during the EQ and post-EQ stress period and could be considered as a front line intervention
- Benefits may be more marked for those with existing psychopathology
- Higher doses may confer greater benefits
- Nutritional supplements are relatively cheap and easy to provide to communities cf other psychosocial, medical, organizational interventions
- Protection against worsening anxiety, depression, PTSD symptoms may be gained with little professional contact that is maintained up to one year





IES Total Scores Baseline & Treatment Week 3 Compared



Results

- ▶ No differences in baseline functioning, co-occurring diagnoses, ADHD subtype, SES, gender, ethnicity, IQ
- ▶ No group differences at Time 1
- ▶ At Time 2, those taking micronutrients reported significantly less anxiety and stress (effect size 0.69) than those not taking them
- ▶ no change from baseline to Time 2 for control group (effect sizes ranged from 0.11-0.45)
- ▶ significant changes in *all areas assessed* for micronutrient group at Time 2 (effect sizes ranged from 0.73-1.01)